

REMARKS

By this amendment, Applicants have amended claims 2 and 14 to more clearly define their invention. In particular, claims 2 and 14 have been amended to eliminate the indefiniteness problems noted by the Examiner in numbered section 3 of the Office Action. In addition, claim 2 has been amended to recite that the apparatus includes a blower for circulating combustion exhaust gas from an outlet of the furnace to the inlet of the inhibiting gas supply means (see, e.g., Figures 5 and 6 and the description thereof in Applicants' specification) and to recite that the nitrogen oxide generation inhibiting gas is constituted by at least one gas selected from a group consisting of the combustion exhaust gas and a mixed gas of the combustion exhaust gas and air. Claim 26 has been canceled without prejudice or disclaimer and the dependency of claims 4, 10, 13 and 14 revised.

Initially, it is submitted the finality of the outstanding Office Action is premature and should be withdrawn. The outstanding Office Action contains a new ground of rejection. In particular, in numbered section 3 of the Office Action, claim 2 has been rejected under 35 U.S.C. 112, second paragraph, as reciting a Markush group using an improper format including the phrase "comprising." See, the penultimate paragraph on page 3 of the Office Action. Since the Markush group recited in claim 2 previously appeared in original claim 3, the amendment filed July 7, 2008 did not necessitate this new ground of rejection of claim 2.

Since the Office Action contains a new ground of rejection not necessitated by amendment, the finality of the Office Action is premature and must be withdrawn, and this amendment entered.

Even if the finality of the Office Action is not withdrawn, entry of this amendment under 37 CFR 1.116 is requested. Initially, it is submitted the amendment places the

application in condition for allowance for the reasons set forth hereinafter or, at least, in better form for consideration on appeal. Moreover, the amendment addresses arguments made by the Examiner in numbered section 1 of the Office Action and, therefore, it is necessary and could not have been earlier presented. Therefore, entry of this amendment under 37 CFR 1.116 is proper.

In view of the foregoing remarks, it is submitted all of the claims now in the application comply with the requirements of 35 U.S.C. 112, second paragraph. Therefore, reconsideration and withdrawal of the rejection of claims 2, 4-16 and 26 under 35 U.S.C. 112, second paragraph, are requested.

Claims 2, 4, 11, 13-16 and 26 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,545,307 to Morita et al. in view of U.S. Patent No. 5,727,480 to Garcia-Mallol. Applicants traverse this rejection and request reconsideration thereof.

The present invention relates to a combustion apparatus including a burner burning a fuel within a furnace in a theoretical air ratio or less, an air port arranged downstream of the burner and injecting additional combustion air into the furnace, an inhibiting gas supply means for supplying a nitrogen oxide generation inhibiting gas inhibiting a nitrogen oxide from being generated, and a blower for circulating combustion exhaust gas from an outlet of the furnace to an inlet of the inhibiting gas supply means. The inhibiting gas supply means is provided in a mixing region formed by both a combustion gas generated by burning the fuel by means of the burner and a combustion air injected from the air port or near the mixing region. The inner side of the air port is separated into a flow path injecting the combustion air and a flow path injecting the nitrogen oxide generation inhibiting gas. The nitrogen oxide generation

inhibiting gas is constituted by at least one gas selected from a group consisting of the combustion exhaust gas and a mixed gas of the combustion exhaust gas and air.

The Morita et al. patent discloses a coal combustion apparatus, which apparatus comprises a pulverized coal-feeding pipe inserted into a burner throat on the lateral wall of a combustion furnace and for feeding the coal and air into the furnace; a means for feeding the coal and air into the coal pipe; a secondary air passageway formed between the coal pipe and a secondary air-feeding pipe provided on the outer peripheral side of the coal pipe; a ternary air passageway formed on the outer peripheral side of the secondary air-feeding pipe; a means for feeding air or an oxygen-containing gas into the secondary air passageway and that into the ternary air passageway; and a bluff body having a cross-section of a L-letter form provided at the tip end of the coal pipe.

In the “Description of the Prior Art” section of Morita et al. from column 1, line 11 to column 2, line 44, the “two-stage” combustion process shown in Figure 1 is described (see, e.g., column 1, lines 43-56), the disadvantages of the two-stage combustion process are described (see, e.g., column 1, lines 57-63) and the “dual resistor type burner” used in place of controlling the combustion of the whole of boilers, i.e., in place of the two-stage combustion of Figure 1, is described (see, column 1, line 64 to column 2, line 44). From column 2, line 45 to the end of the Morita et al. patent, a modification of the dual resistor type burner is described and claimed.

While the Office Action relies on Figure 1 of the Morita et al., the disclosure of Morita et al. actually teaches away from the arrangement in Figure 1.

Moreover, as admitted by the Examiner, the Morita et al. patent, even in Figure 1, does not disclose the presently claimed invention, including “wherein an inner side of the air port is separated into a flow path injecting the combustion air, and a flow path injecting the nitrogen oxide generation inhibiting gas.”

In Garcia-Mallol, the secondary air flows out from the passages 28 and 30; however, air having the same composition and temperature flows out therefrom.

Thus, even assuming, *arguendo*, one of ordinary skill in the art would have used the two-stage combustion arrangement of Figure 1 of Morita et al. and combined it with the over-fire air control system of Garcia-Mallol, even the combination would not have rendered obvious the presently claimed invention. That is, even the combination of Morita et al. and Garcia-Mallol would not have rendered obvious the presently claimed combustion apparatus including the presently claimed inhibiting gas supply means, the presently claimed blower and the use of a nitrogen oxide generation inhibiting gas constituted by at least one gas selected from a group consisting of the combustion exhaust gas and a mixed gas of the combustion exhaust gas and air.

More particularly, Garcia-Mallol describes that the damper 22a controls the amount of air circulating in the flow path 28, and the damper 22b controls the amount of air circulating in the flow path 30, as shown in Fig. 1 and described in the relevant description. However, since the two dampers are within the same duct 24 and only the secondary air enters into the duct 24, only the secondary air is distributed. In other words, fluid having the same composition flows to the flow paths from two dampers, and the fluid is the secondary air. The fact that the secondary air is the combustion air is particularly based on the description in line 66, column 3, to line 22, column 4 of Garcia-Mallol.

On the other hand, in the present invention, the nitrogen oxide generation inhibiting gas is the combustion exhaust gas or a mixed gas of the combustion exhaust gas and air, the combustion exhaust gas being circulated from furnace to the inhibiting gas supply means by a blower. Accordingly, the present invention is different from Garcia-Mallol alone or in combination with Morita et al.

The allegation in numbered section 1 of the Office Action that the Morita et al. patent discloses the use of air, combustion exhaust gas or mixtures thereof in column 8, lines 38-39 and, therefore, that the “the air composition of Garcia-Mallol is irrelevant” is noted. However, the disclosure at column 8, lines 38-39 of Morita et al. refers to the apparatus shown in Figures 3-7, not to the two-stage combustion apparatus shown in Figure 1. Since the Office Action relies on the combination of Figure 1 of Morita et al. with the over-fire air control system of Garcia-Mallol, the disclosure at column 8, lines 38-39 of Morita et al. is irrelevant to the proposed combination.

Thus, the proposed combination of Morita et al. and Garcia-Mallol does not render obvious the presently claimed invention.

Claim 12 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Morita et al. in view of U.S. Patent No. 5,231,937 to Kobayashi et al. Applicants traverse this rejection and request reconsideration thereof.

The Kobayashi et al. patent has been cited by the Examiner as allegedly teaching that is known to lower the temperature of an exhaust gas by means of a heat exchanger. However, since claim 12 ultimately depends from claim 2, it is submitted claim 12 is patentable at least for the reasons noted above with respect to claim 2.

In view of the foregoing amendments and remarks, withdrawal of the finality of the Office Action, entry of this amendment and favorable reconsideration and allowance of all of the claims now in the application are requested.

Please charge any shortage in the fees due in connection with the filing of this

paper, including excess claim fees, to Deposit Account No. 01-2135 (500.45104X00),
and please credit any excess fees to such deposit account.

Respectfully submitted,
ANTONELLI, TERRY, STOUT & KRAUS, LLP

/Alan E. Schiavelli/

Alan E. Schiavelli

Registration No. 32,087